# COSEWIC
# Status Appraisal Summary

on the

# Frosted Glass-whiskers
## *Sclerophora peronella*

Atlantic Population
Pacific Population

**in Canada**

**Atlantic Population - SPECIAL CONCERN**
**Pacific Population - DATA DEFICIENT**
**2014**

**COSEWIC**
Committee on the Status
of Endangered Wildlife
in Canada

**COSEPAC**
Comité sur la situation
des espèces en péril
au Canada

COSEWIC status appraisal summaries are working documents used in assigning the status of wildlife species suspected of being at risk in Canada. This document may be cited as follows:

COSEWIC. 2014. COSEWIC status appraisal summary on the Frosted Glass-whiskers *Sclerophora peronella* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xx pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

Production note:
COSEWIC would like to acknowledge Robert Cameron for writing the status appraisal summary on the Frosted Glass-whiskers (*Sclerophora peronella*) in Canada, prepared under contract with Environment Canada. This status appraisal summary was overseen and edited by David Richardson, co-chair of the COSEWIC Mosses and Lichens Specialist Subcommittee.

For additional copies contact:

COSEWIC Secretariat
c/o Canadian Wildlife Service
Environment Canada
Ottawa, ON
K1A 0H3

Tel.: 819-938-4125
Fax: 819-938-3984
E-mail: COSEWIC/COSEPAC@ec.gc.ca
http://www.cosewic.gc.ca

Également disponible en français sous le titre Sommaire du statut de l'espèce du COSEPAC sur le Sclérophore givré (*Sclerophora peronella*) au Canada.

©Her Majesty the Queen in Right of Canada, 2014.
Catalogue No. CW69-14/2-45-2015E-PDF
ISBN 978-1-100-25617-7

# COSEWIC
# Assessment Summary

**Assessment Summary – November 2014**

**Common name**
Frosted Glass-whiskers - Atlantic population

**Scientific name**
*Sclerophora peronella*

**Status**
Special Concern

**Reason for designation**
This tiny stubble lichen is rare over much of its global range; in Canada, thirteen occurrences are in Nova Scotia. The lichen is known only from the exposed heartwood of old red maple trees in wetlands or uplands. The main threat is the loss of habitat and tree removal associated with increased harvesting of upland and 'low grade' wetland hardwoods for biomass energy generation, firewood and other products. A second threat is the blow-down of old maple trees by an increasing number of extreme weather events related to climate change.

**Occurrence**
Nova Scotia

**Status history**
Designated Special Concern in May 2005. Status re-examined and confirmed in November 2014.

**Assessment Summary – November 2014**

**Common name**
Frosted Glass-whiskers - Pacific population

**Scientific name**
*Sclerophora peronella*

**Status**
Data Deficient

**Reason for designation**
This tiny stubble lichen has only been found at two sites in British Columbia. One in the Skeena River Basin was not found again when the site was revisited. An additional occurrence was recorded subsequently near Albert River, British Columbia, just south of Kootenay National Park. Considerable search effort since has not revealed more sites for this lichen in British Columbia. The exact ecological niche occupied by the Pacific population of this lichen is not understood.

**Occurrence**
British Columbia

**Status history**
Species considered in May 2005 and placed in the Data Deficient category. Status re-examined and confirmed in November 2014.

# COSEWIC
# Status Appraisal Summary

Atlantic Population (Designatable Unit 1)
Pacific Population (Designatable Unit 2)

## Atlantic Population (Designatable Unit 1)

*Sclerophora peronella:*
Frosted Glass-whiskers – Atlantic Population

Sclérophore Givré – Population de l'Atlantique

**Status History:**

Designated Special Concern in May 2005. Status re-examined and confirmed in November 2014.

**Evidence (indicate as applicable):**

| **Wildlife species:** | |
|---|---|
| Change in eligibility, taxonomy or designatable units: | yes ☐ no ☒ |

| **Range:** | |
|---|---|
| Change in extent of occurrence (EO): | yes ☒ no ☐ unk ☐ |
| Change in index of area of occupancy (IAO): | yes ☒ no ☐ unk ☐ |
| Change in number of known or inferred current locations*: | yes ☒ no ☐ unk ☐ |
| Significant new survey information: | yes ☒ no ☐ unk ☐ |

Explanation:

Extent of Occurrence and IAO:

There have been increases in both the index of area of occupancy (IAO) and the number of known locations for *Sclerophora peronella* in Nova Scotia.

The IAO in the 2005 COSEWIC report was <1 $km^2$ using the total area of site coverage for the species. Since then, eleven new occurrences have been discovered by Frances Anderson in Misery Lake, Shelburne County, and Franey Corner; Tom Neily in Lake Mulgrave, Moose River and MacPhail Lake, Halifax County; and Rob Cameron in Wentworth Lake, Chris Pepper in Jordan Falls, also in Shelburne County, and by Frances Anderson at Deep Cove, Lunenburg County. When using the site coverage approach for calculating the IAO, it remains at <1 $km^2$. However, when measured using the currently recommended 2 km x 2 km grid system (IUCN 2011), the IAO increases to 60 $km^2$ for the Atlantic population.

New Survey Information:

The original finds of this species were in upland old deciduous forests. Since the last COSEWIC assessment, there has been significant new survey effort in Nova Scotia. As a result *S. peronella* was discovered in forested wetland habitats. Frances Anderson and Tom Neily have made a concerted effort to find this species during their frequent lichen surveys in Nova Scotia and searched at least 60 sites, while a further 15 sites

have been searched by Robert Cameron and Troy McMullin. The latter also searched Kejimkujik National Park, where he found another *Sclerophora* species but not *S. peronella*. It is now realized that the lichen is only found on trees with existing damage that allows the heartwood to be exposed yet provides protected nooks and corners for the lichen to colonize. Although it varies by site, in such situations 1-5% of trees that are damaged in this way are found to be colonized by *S. peronella*. This lichen can occur in both upland and wetland habitats but is more common in the latter where it was not known until the recent surveys. Steven Selva, who made the original discoveries reported in the earlier status report, confirmed the finds at Misery Lake and Franey's corner.

Stephen Clayden and Steven Selva have recently made extensive collections of stubble lichens (Caliciales) in cedar stands in New Brunswick but did not find *S. peronella* (Clayden and Selva pers. comm.). Collections of Caliciales have also been made by Claude Roy, from Université Laval in Quebec. One collection in the Laurentides was identified as the closely related *S. nivea* by Steven Selva.

Wherever this lichen is found, it only occurs on a very few trees (<6), and usually one or two trees, per site, and the occurrences are widely scattered in its distribution

* Use the IUCN definition of "location"

| **Population Information:** | |
|---|---|
| Change in number of mature individuals: | yes ☒ no ☐ unk ☐ |
| Change in population trend: | yes ☐ no ☐ unk ☒ |
| Change in severity of population fragmentation: | yes ☐ no ☐ unk ☒ |
| Change in trend in area and/or quality of habitat: | yes ☒ no ☐ unk ☐ |
| Significant new survey information | yes ☒ no ☐ |

E Explanation:

Change in Number of Mature Individuals:

The 2005 COSEWIC report noted that *Sclerophora peronella* was found as an extensive thallus on two single trees in upland old growth deciduous forests in Nova Scotia.

New discoveries in 2013 have been made at Misery Lake, Lake Mulgrave, Franey Corner, Jordan Falls, Deep Cove, Moose River, MacPhail Lake, Veitch Lake, Whites Lake and Wentworth Lake (see Figure 2 and Table 1).

At Misery Lake Brook, the lichen was present on six maples in a mixedwood treed swamp. This forest consisted of mature Red Maple (*Acer rubrum*) and Balsam Fir (*Abies balsamea*).

At another site in Lake Mulgrave, Halifax county, the lichen was also in a treed wetland of Balsam Fir and Red Maple. Although the trees are not very large, they may be old in these wetlands, where it is suspected that there has been a long continuity of forest cover.

At Franey Corner, the host Red Maple was in the flood range of a perennial brook, near the brook edge. The surrounding forest was mixed hardwood/conifer, including hemlock and oak.

At the site near Wentworth Lake, Shelburne County, confirmed after examining the spores and stalk composition, the habitat was similar to the other recent finds.

Explanation:

Change in Area of Habitat:

It is now realized that this lichen can occur in both old deciduous upland forests and on old deciduous trees in swamps. Thus the area of habitat in which this lichen might be found has increased. The traditional description of the substratum for this lichen is "exposed heartwood," and this is true for the new finds in Nova Scotia. Thalli of *S. peronella* are found tucked away in protected areas away from environmental stresses. In four of the trees on which *S. peronella* was found in Misery Lake, Shelburne County, NS, there was a major split in the trunk. Another thallus, at the same location, occurred on a very old red maple that had been split near the base and had rotted away to the other side. A further site, some 500-800m north of these trees, was in a more open swamp but in a similar habitat. Again *S. peronella* was found on exposed maple heartwood away from the elements.

Threats:

Change in nature and/or severity of threats: yes ☒ no ☐ unk ☐

Explanation:

The main threats faced by *S. peronella* are forest harvesting and the loss of host old maple trees due to natural processes.

*Sclerophora peronella* is threatened by forest harvesting in areas which are not protected. Biomass energy generation in Nova Scotia will increase the harvesting pressure on what are often regarded as old but low grade deciduous hardwoods. A new biomass generator aims to supply 4% of the power needs of Nova Scotia (Erskine 2013). Harvesting of mature Red Maple in upland areas and treed swamps will likely lead to a reduction in the amount of suitable substratum and the quality of habitat for S. *peronella*. The new discoveries at Misery Lake and Wentworth Lake, Shelburne County, may be afforded protection as they are within proposed Nature Reserves.

This lichen grows on trees that have been damaged by natural process and thus weakened. Such trees are threatened by extreme weather events, which are predicted to increase in the future. Wind-throw of such trees or nearby ones leads to death of the lichen, which can also be threatened by microclimate changes in the immediate habitat. However, if the weather events are not too extreme, trees may be damaged without being blown down, which could increase the amount of suitable habitat for the Frosted Glass-whiskers to colonize.

*Sclerophora peronella* colonizes exposed heartwood that provides protected nooks and corners for the lichen. These old trees, with existing rifts in the protective outer bark and cambium layers, are vulnerable to damage by insects, fungal infections leading to death and general decay, resulting in loss of habitat for the lichen.

**Protection:**

Change in effective protection: No ☒ Yes ☐

Explanation:

The species is now listed under SARA and a management plan has been prepared and published. Furthermore, the two historic occurrences in Nova Scotia are in protected areas and two of the new occurrences are within proposed Nature Reserves which are currently under moratorium with respect to harvesting. They may become officially designated as protected in 2015.

The Deep Cove occurrence is on a Nature Conservancy property and so has a degree of protection.

The Franey Corner occurrence is at the river's edge on private land, where riparian buffers apply. However, some harvesting in buffers is allowed, and people often violate the buffer law, which tends not to be enforced.

The new occurrences in Mulgrave Lake and at MacPhail, Halifax County, Nova Scotia, are both on Crown land, and the new occurrence at Moose River is on private land, so these are not currently being protected.

**Rescue Effect:**

Change in evidence of rescue effect: yes ☐ no ☒

Explanation:

Rescue from other populations is very unlikely.

**Quantitative Analysis:**

Change in estimated probability of extirpation: yes ☒ no ☐ unk ☐

Details:

More occurrences have been discovered, which should reduce the probability of extirpation. No quantitative analysis has been performed to date.

**Summary and Additional Considerations: [e.g., recovery efforts]**

A management plan for *S. peronella* in NS has been completed (Environment Canada 2011). In addition a Nova Scotia Lichen Recovery Team has been established, which meets annually to review species that have been given a designation by COSEWIC.

The main objective of the Frosted Glass-whiskers management plan is to maintain current occurrences and any new occurrences in NS. It is recognized that "clear cutting results in total loss of habitat and thus eliminates any individuals that occur. However selective cutting within an old-growth forest, or any industrial activities in adjacent areas could potentially alter the conditions such that they are no longer appropriate for Frosted Glass-whiskers".

The broad strategies of the management plan are to ensure adequate protection of habitat and to determine if there are additional occurrences in Nova Scotia. To achieve this it was proposed that Wilderness Area managers should restrict activities near the known sites for *S. peronella*, that the host trees should be monitored every five years to confirm the continued existence of the lichen, that the number of fruit bodies should be enumerated at each site, and that experts familiar with the lichen undertake inventories to search habitats for the lichen. The host trees were reported to be monitored in 2008 at Sugarloaf Mountain and the lichen was found still to be present (Robert Cameron pers. comm.). The new trail development at Sugarloaf Mountain was implemented to avoid *S. peronella* habitat. Lichenologists in Nova Scotia have increased surveys for this lichen, but not all searched sites are suitable (black spruce/tamarack swamps, for example, coastal headlands, etc.). Until recently the typical microhabitat where this lichen occurs was not appreciated.

## TECHNICAL SUMMARY #1 – ATLANTIC POPULATION

*Sclerophora peronella*

Frosted Glass-whiskers - Atlantic Population

Sclérophore givré - Population de l'Atlantique

Range of Occurrence in Canada: Nova Scotia

**Demographic Information**

| | |
|---|---|
| Generation time (usually average age of parents in the population; indicate if another method of estimating generation time indicated in the IUCN guidelines(2008) is being used) | Unknown |
| Is there an [observed, inferred, or projected] continuing decline in number of mature individuals? | Unknown |
| Estimated percent of continuing decline in total number of mature individuals within [5 years or 2 generations] | Unknown |
| [Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over the last [10 years, or 3 generations]. | Unknown |
| [Projected or suspected] percent [reduction or increase] in total number of mature individuals over the next [10 years, or 3 generations]. | Unknown |
| [Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over any [10 years, or 3 generations] period, over a time period including both the past and the future. | Unknown |
| Are the causes of the decline clearly reversible and understood and ceased? | No |
| Are there extreme fluctuations in number of mature individuals? | Unlikely |

**Extent and Occupancy Information**

| | |
|---|---|
| Estimated extent of occurrence | < 24,500 km² |
| Index of area of occupancy (IAO)<br>(Always report 2x2 grid value). | 60 km² |
| Is the population severely fragmented? | No |
| Number of locations* | 13 |
| Is there an [observed, inferred, or projected] continuing decline in extent of occurrence? | No |
| Is there an [observed, inferred, or projected] continuing decline in index of area of occupancy? | No |
| Is there an [observed, inferred, or projected] continuing decline in number of populations? | No |
| Is there an [observed, inferred, or projected] continuing decline in number of locations*? | No |
| Is there an [observed, inferred, or projected] continuing decline in [area, extent and/or quality] of habitat? | Yes – There has been a continuing decline in the amount of old forest in NS |
| Are there extreme fluctuations in number of populations? | Unlikely |
| Are there extreme fluctuations in number of locations*? | No |

* See Definitions and Abbreviations on COSEWIC website and IUCN 2010 for more information on this term.

| | |
|---|---|
| Are there extreme fluctuations in extent of occurrence? | No |
| Are there extreme fluctuations in index of area of occupancy? | No |

**Number of Mature Individuals (in each population)**

| | |
|---|---|
| Population (Number of mature individuals) | Uncertain – at least several mature thalli occur at four occurrences, and at least one mature thallus at nine other occurrences. Therefore there are at least 27 mature thalli in NS. There are probably more thalli to be found but the number is likely less than 100. |
| Total | >27 but less than 100 |

**Quantitative Analysis**

| | |
|---|---|
| Probability of extinction in the wild is at least [20% within 20 years or 5 generations, or 10% within 100 years]. | No analysis done |

**Threats (actual or imminent, to populations or habitats)**

Misery Lake and Wentworth Lake, Shelburne County location, may be threatened by forestry if not protected in 2015, and the Mulgrave Lake and MacPhail Lake, Halifax County, occurrences are threatened by forestry.

*S. peronella* grows on trees that have been damaged by natural processes and thus weakened. Such trees are threatened by extreme weather events, which are predicted to increase in future. However, if the events are not too extreme, trees may be damaged without being blown down, which could increase the amount of suitable habitat for the Frosted Glass-whiskers to colonize.

Acid rain and atmospheric pollutants: Acidification of the substratum may be a threat but the severity of the impact is currently not known. The species appears to be restricted to maple, the bark and wood of which has a high pH compared with trees like birch.

Loss of habitat from forestry may be a threat and the existing habitat is fragmented.

**Rescue Effect (immigration from outside Canada)**

| | |
|---|---|
| Status of outside population(s): NatureServe lists *S. peronella* as GNR. There is no ranking in the USA. | |
| Is immigration known or possible? | Possible but unlikely |
| Would immigrants be adapted to survive in Canada? | Likely |
| Is there sufficient habitat for immigrants in Canada? | Yes |
| Is rescue from outside populations likely? | No |

**Data-Sensitive Species**

| |
|---|
| Is this a data-sensitive species? No |

**Status History**

| |
|---|
| Designated Special Concern in May 2005. Status re-examined and confirmed in November 2014. |

**Status and Reasons for Designation**

| **Status**:<br>Special Concern | **Alpha Numeric Code**:<br>Not Applicable |
|---|---|
| **Reasons for Designation**:<br>This tiny stubble lichen is rare over much of its global range; in Canada, thirteen occurrences are in Nova Scotia. The lichen is known only from the exposed heartwood of old red maple trees in wetlands or uplands. The main threat is the loss of habitat and tree removal associated with increased harvesting of upland and 'low grade' wetland hardwoods for biomass energy generation, firewood and other procucts. A second threat is the blow-down of old maple trees by an increasing number of extreme weather events related to climate change. | |

**Applicability of Criteria**

| |
|---|
| Criterion A: Not applicable. |
| Criterion B: Nearly meets criterion for Endangered B1ab(iii)+2ab(iii) with IAO < 500 $km^2$, but exists at 13 locations. There is an inferred decline in habitat based on loss of old maple trees from harvest and extreme weather events. |
| Criterion C: Not applicable. |
| Criterion D: Nearly meets criterion for Threatened D2, (IAO 60 $km^2$, 13 locations), with threats associated with hardwood harvest and host tree loss during extreme weather events. |
| Criterion E: Not applicable. |

## Pacific Population (Designatable Unit 2)

*Sclerophora peronella*:
Frosted Glass-whiskers - Pacific Population — Sclérophore Givré - Population du Pacifique

**Status History**:

Species considered in May 2005 and placed in the Data Deficient category. Status re-examined and confirmed in November 2014.

**Evidence (indicate as applicable):**

| **Wildlife species:** | |
|---|---|
| Change in eligibility, taxonomy or designatable units: | yes ☐ no ☒ |

| **Range:** | |
|---|---|
| Change in extent of occurrence (EO): | yes ☐ no ☒ unk ☐ |
| Change in index of area of occupancy (IAO): | yes ☐ no ☒ unk ☐ |
| Change in number of known or inferred current locations*: | yes ☐ no ☒ unk ☐ |
| Significant new survey information: | yes ☒ no ☐ |

Explanation:

The only site in British Columbia, listed in the 2005 COSEWIC report on this species, was on Black Cottonwood (*Populous trichocarpa*) at Skeena River Basin. It was revisited that year by Trevor Goward but he failed to find it again. An additional location was found by Toby Spribille that same year, 2005, near Albert River, BC, just south of Kootenay National Park.

Considerable new search effort has been made since 2005, but no additional occurrences of *Sclerophora peronella* have been discovered.

Curtis Björk has 15,000 lichen records from all corners of BC since 2005 and looks for stubble lichens, particularly *Sclerophora*. He has not found the *S. peronella* in his surveys.

Patrick Williston has put significant effort into looking for this species, especially on *Populus trichocarpa*, but also on *Acer glabrum*, *Alnus rubra* and *Betula papyrifera*. He has several hundred collections of stubble lichens (Caliciales) and has documented many new records for *S. amabilis*, and two new ones for *S. nivea*, which is closely related to *S. peronella*. He has also found several population of *S. coniophaea*. These searches have included the Kitimat valley, the Skeena River valley, the Kispiox River valley, the Bulkley River, the upper Fraser River drainage (Mount Robson), the Athabasca River (*S. nivea*—new for Alberta), Jasper National Park, the Bell Irving River, and Surprise Creek (near Stewart, BC).

Toby Spribille has also conducted numerous surveys for Caliciales in British Columbia but no further discoveries of *S. peronella* have been confirmed. Toby Spribille (pers. comm.) has made 278 collections of Caliciales in western Canada since 2005.

Trevor Goward (pers. comm.) has continued to look for more occurrences of this lichen but has found none. He suggests that search effort for this species has now been large enough that it should no longer be considered data deficient. However, data on the distribution of searched sites is not available at this time and the exact ecological niche occupied by the Pacific DU of this lichen seems not to be understood.

*S. peronella has been found Infrequently (14 specimens) on wood and bark at lower elevations of aged* Quercus garrayana *woodlands in the Willamette Valley, Oregon, USA (Rikkinen 2003).*

* Use the IUCN definition of "location"

| **Population Information:** | |
|---|---|
| Change in number of mature individuals: | yes ☐ no ☒ unk ☐ |
| Change in population trend: | yes ☐ no ☐ unk ☒ |
| Change in severity of population fragmentation: | yes ☐ no ☒ unk ☐ |
| Change in trend in area and/or quality of habitat: | yes ☐ no ☒ unk ☐ |
| Significant new survey information: | yes ☒ no ☐ |
| Explanation: see above for explanation of significant new survey information. | |

| **Threats:** | |
|---|---|
| Change in nature and/or severity of threats: | yes ☐ no ☒ unk ☐ |
| Explanation: no change | |

| **Protection:** | |
|---|---|
| Change in effective protection: | yes ☐ no ☒ |
| Explanation: no change | |

| **Rescue Effect:** | |
|---|---|
| Change in evidence of rescue effect: | yes ☐ no ☒ |
| Explanation. no change | |

| **Quantitative Analysis:** | |
|---|---|
| Change in estimated probability of extirpation: | yes ☐ no☒ |
| Details: no analysis done | |

| **Summary and Additional Considerations: [e.g., recovery efforts]** | None known |
|---|---|

## TECHNICAL SUMMARY #2 - PACIFIC POPULATION

*Sclerophora peronella*

Frosted Glass-whiskers - Pacific Population — Sclérophore givré - Population du Pacifique

Range of Occurrence in Canada: British Columbia

**Demographic Information**

| | |
|---|---|
| Generation time (usually average age of parents in the population; indicate if another method of estimating generation time indicated in the IUCN guidelines(2008) is being used) | Unknown |
| Is there an [observed, inferred, or projected] continuing decline in number of mature individuals? | Unknown |
| Estimated percent of continuing decline in total number of mature individuals within [5 years or 2 generations] | Unknown |
| [Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over the last [10 years, or 3 generations]. | Unknown |
| [Projected or suspected] percent [reduction or increase] in total number of mature individuals over the next [10 years, or 3 generations]. | Unknown |
| [Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over any [10 years, or 3 generations] period, over a time period including both the past and the future. | Unknown |
| Are the causes of the decline clearly reversible and understood and ceased? | No |
| Are there extreme fluctuations in number of mature individuals? | Unlikely |

**Extent and Occupancy Information**

| | |
|---|---|
| Estimated extent of occurrence | 1000 km between occurrences |
| Index of area of occupancy (IAO)<br>(Always report 2x2 grid value). | 4 km² – some uncertainty as one occurrence may not still be extant |
| Is the population severely fragmented? | Possibly – BC populations are widely separated (~1000 km apart) |
| Number of locations* | 1 – uncertain if one location is still extant |
| Is there an [observed, inferred, or projected] continuing decline in extent of occurrence? | No |
| Is there an [observed, inferred, or projected] continuing decline in index of area of occupancy? | Uncertain - one occurrence may not still be extant |
| Is there an [observed, inferred, or projected] continuing decline in number of populations? | Uncertain - one occurrence may not still be extant |

* See Definitions and Abbreviations on COSEWIC website and IUCN 2010 for more information on this term.

| | |
|---|---|
| Is there an [observed, inferred, or projected] continuing decline in number of locations*? | Uncertain – one occurrence may not still be extant |
| Is there an [observed, inferred, or projected] continuing decline in [area, extent and/or quality] of habitat? | Yes – There has been a continuing decline in the amount of old growth forest in BC |
| Are there extreme fluctuations in number of populations? | Unlikely |
| Are there extreme fluctuations in number of locations? | No |
| Are there extreme fluctuations in extent of occurrence? | No |
| Are there extreme fluctuations in index of area of occupancy? | No |

**Number of Mature Individuals (in each population)**

| **Population** | Uncertain – may be at least 2 mature thalli |
|---|---|
| | |
| | |
| Total | Uncertain |

**Quantitative Analysis**

| | |
|---|---|
| Probability of extinction in the wild is at least [20% within 20 years or 5 generations, or 10% within 100 years]. | No analysis done |

**Threats (actual or imminent, to populations or habitats)**

May be threatened by forestry;

Acid rain and atmospheric pollutants;

Loss of habitat (old growth deciduous forest) may be a threat in that there are few new areas to colonize and existing habitat is fragmented and small in extent.

**Rescue Effect (immigration from outside Canada)**

| Status of outside population(s)? NatureServe lists *S. peronella* as GNR. There is no ranking in the USA. | |
|---|---|
| Is immigration known or possible? | Possible but unlikely |
| Would immigrants be adapted to survive in Canada? | Likely |
| Is there sufficient habitat for immigrants in Canada? | Unknown |
| Is rescue from outside populations likely? | No |

**Data-Sensitive Species**

| | |
|---|---|
| Is this a data-sensitive species? | No |

**Status History**

| |
|---|
| Species considered in May 2005 and placed in the Data Deficient category. Status re-examined and confirmed in November 2014. |

**Status and Reasons for Designation**

| **Status**: Data deficient | **Alpha-numeric Code**: Not applicable |
|---|---|
| **Reasons for Designation:** This tiny stubble lichen has only been found at two sites in British Columbia. One in the Skeena River Basin was not found again when the site was revisited. An additional occurrence was recorded subsequently near Albert River, British Columbia, just south of Kootenay National Park. Considerable search effort since has not revealed more sites for this lichen in British Columbia. T[illegible] exact ecological niche occupied by the Pacific population of this lichen is not understood. | |

**Applicability of Criteria**

| |
|---|
| Criterion A: Not applicable. |
| Criterion B: Not applicable. |
| Criterion C: Not applicable since the number of individuals is not known. |
| Criterion D: Not applicable. |
| Criterion E: Not applicable. |
| Criterion D (Very Small or Restricted Population): Possibly D2 < 5 locations may apply. |
| Criterion E (Quantitative Analysis): Not applicable. |


## Acknowledgements and Authorities Contacted:

The following individuals provided information and comments that helped in the preparation of this status appraisal summary:

Frances Anderson, Research Associate, Nova Scotia Museum of Natural History, N.S.

Curtis Björk , Research Associate University of Idaho, Botany Consultant

Trevor Goward, UBC Curator of Lichens and Enlichened Consulting Ltd.

Tom Neily, Researcher, Mersey Tobeatic Research Institute, Queens County, Nova Scotia

Stephen Clayden. New Brunswick Museum, Saint John, New Brunswick

Steven Selva, Professor of Biology and Environmental Studies at the University of Maine at Fort Kent

Toby Spribille, Post-doctoral Researcher, University of Montana and University of Graz, Austria

Patrick Willison, Smithers, B.C.

**Information Sources:**


Environment Canada 2011. Management Plan for the Frosted Glass-whiskers (*Sclerophora peronella*), Nova Scotia Population, in Canada. *Species at Risk Act* Management Plan Series. Environment Canada, Ottawa. iii + 11 pp. WWW.sararegistry.gc.ca and http://publications.gc.ca/collections/collection_2011/ec/En3-5-18-2011-eng.pdf).

COSEWIC 2005 COSEWIC assessment and status report on the Frosted glass-whiskers *Sclerophora peronella* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 28 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

Erskine, B. 2013. NSP biomass site aims for 4% of power needs in N.S. Chronicle Herald, July 3rd, B2.

Rikkinen, J. 2003. Calicioid lichens and fungi in the forests and woodlandsof western Oregon. Acta Botanica Fennica 175: 1–41


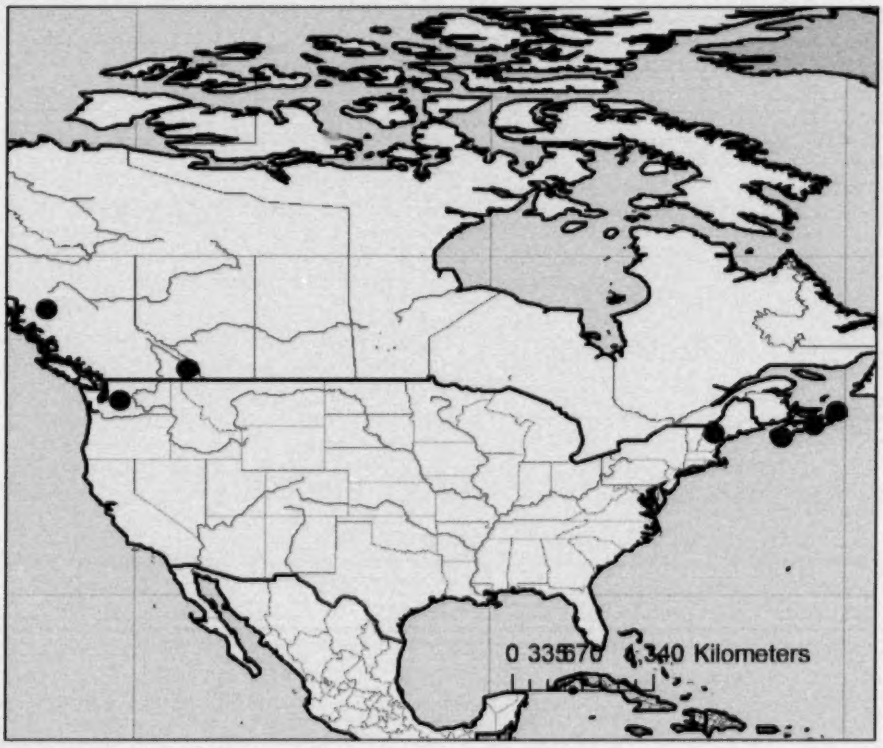


Figure 1. Distribution of *Sclerophora peronella* in North America indicated by dots.

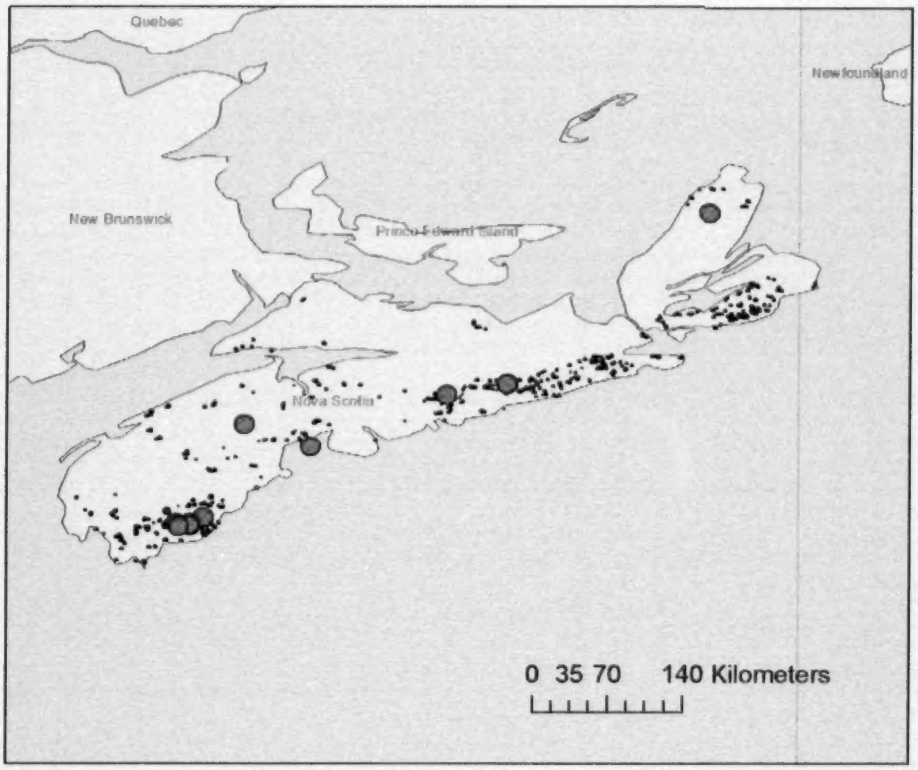


Figure 2 The occurrences of *Sclerophora peronella* in Nova Scotia, Canada. Red dots indicate known occurrences and black dots indicate areas that were searched unsuccessfully.

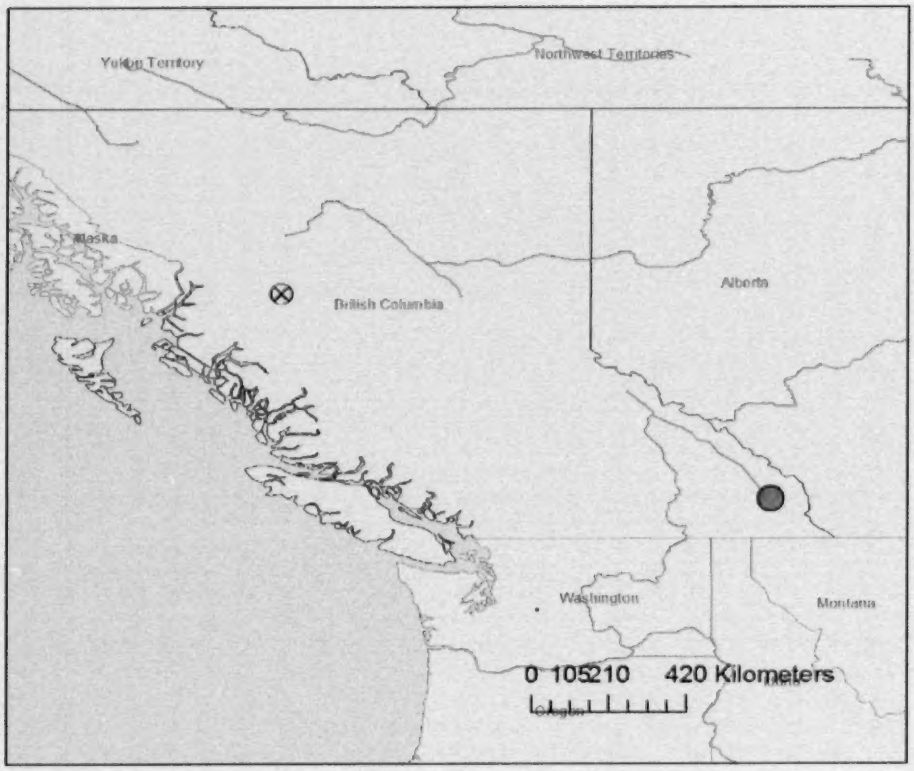


Figure 3 The occurrences of *Sclerophora peronella* in British Columbia. The red dot indicates the occurrence at Albert River, BC, just south of Kootenay National Park, that is still likely extant. The circle with an X indicates the occurrence in the Skeena River Basin, which may no longer be extant as it was not found when the site was revisited.

**Table 1. List of the occurrences of the Nova Scotia population of *Sclerophora peronella*.**

| County in Nova Scotia | Occurrence |
|---|---|
| Shelburne | Misery Lake |
| | Wentworth Lake |
| | Jordon Falls |
| | Veitch Lake |
| | Whites Lake |
| Queens | Wilkins Lake |
| Lunenburg | Franey Corner |
| | Deep Cove |
| Halifax | Moose River |
| | MacPhail Lake |
| | Mulgrave |
| Inverness | Sugarloaf |
| | Margaree River |

Note: A site is where the lichen is actually found and its position recorded using GPS. When two or more sites are less than 1km apart, they comprise a single occurrence. If two sites are more than a km from one another, they are considered to be separate occurrences. One or more occurrences that are affected by the same major threat or threats are defined as a location (in the IUCN sense that is used by COSEWIC).

## COSEWIC HISTORY

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

## COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

## COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members and the co-chairs of the species specialist subcommittees and the Aboriginal Traditional Knowledge subcommittee. The Committee meets to consider status reports on candidate species.

## DEFINITIONS
## (2014)

| | |
|---|---|
| Wildlife Species | A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years. |
| Extinct (X) | A wildlife species that no longer exists. |
| Extirpated (XT) | A wildlife species no longer existing in the wild in Canada, but occurring elsewhere. |
| Endangered (E) | A wildlife species facing imminent extirpation or extinction. |
| Threatened (T) | A wildlife species likely to become endangered if limiting factors are not reversed. |
| Special Concern (SC)* | A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats. |
| Not at Risk (NAR)** | A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances. |
| Data Deficient (DD)*** | A category that applies when the available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction. |

* Formerly described as "Vulnerable" from 1990 to 1999, or "Rare" prior to 1990.

** Formerly described as "Not In Any Category", or "No Designation Required."

*** Formerly described as "Indeterminate" from 1994 to 1999 or "ISIBD" (insufficient scientific information on which to base a designation) prior to 1994. Definition of the (DD) category revised in 2006.

Environment Canada | Environnement Canada
Canadian Wildlife Service | Service canadien de la faune
Canada

The Canadian Wildlife Service, Environment Canada, provides full administrative and financial support to the COSEWIC Secretariat.